Smart E-Vehicle Monitoring Using GPS And GSM Module

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Abstract- *In this paper, an embedded-based smart E-vehicle is implemented using GPS and GSM to track the E-vehicle. Vehicle theft becomes a growing threat that exist as serious issue with society. Theft of vehicle has an impact to vehicle owners. It costs money to use tracking devices. GPS and GSM guided system created for tracking vehicles. The location of the vehicle is sent from particular distance using a GSM modem. The E-vehicle position can be determined by its latitude and longitude.*

Keywords- GSM (Global System Mobile communication), GPS (Global Positioning System), E-vehicle, Embedded, SMS.

I. INTRODUCTION

The GSM (Global System for Mobile communication) module when the user sends an SMS message, the message gets transmitted from the sending device to the nearest cell tower. The cell tower passes the message to an SMS center (SMSC). Then the SMSC forwards the SMS message to a cell tower near the receiving tower. Lastly the tower send the message to the recipient's device.

II. APPARATUS REQUIRED

Arduino UNO, GSM 800C, GPS 6MV2, Driver L293D, LCD 16x2, 12V DC battery, DC Motor.

i.Arduino UNO

Arduino UNO is a microcontroller board, developed by Arduino cc, based on the Atmega328 microcontroller. The operating voltage is 5V, while the input voltage may vary from 7V to 12V. Arduino UNO has a maximum current rating of 40mA, so the load shouldn't exceed this current rating or may harm the board. It comes with a crystal oscillator of 16MHz, which is its operating frequency. Arduino UNO pinout consists of 14 digital pins starting from D0 to D13. It also has 6 Analog pins starting from A0 to A5.It also has 1 reset pin, which resets the board programmatically. It also has 6 power pins, which provide different voltage levels. Out of

14 pins, 6 pins are used for generating PWM pulses of 8-bit resolution. PWM pins in Arduino UNO are D3, D5, D6, D9, D10 and D11.

ii. GSM 800C

GSM/GPRS modem-RS232 is built with the Quad-Band GSM/GPRS engine-SIM800C, works on frequencies 850/900/1800/1900MHz.The module comes with RS232 interface, which allows to connect PC as well as microcontroller with RS232 Chip (MAX232). The Baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. This module is suitable for SMS, Voice as well as DATA transfer application in M2M interface. Using this modem, audio calls, SMS, Read SMS, attend the incoming calls and internet etc., are possible through simple AT commands.

iii. GPS6MV2

The Global Positioning System (GPS) consists of 31 satellites orbiting earth. We can know their exact location, because they are constantly transmitting position information with time through radio signals. GPS 6MV2 is very small but it packs a lot of features. It can track up to 22 satellites over 50 channels while consuming only 45mA of current and has an operating voltage 2.7V~3.6V. One of the most interesting feature is power-saving mode. This allows a reduction in system power consumption. With power-saving mode on, the current consumption of the module reduces to 11mA.

iv. DRIVER L293D

L293D motor driver IC is an integrated circuit that can drive two motors simultaneously and is usually used to control the motors in an autonomous system. L293D is a dual H-bridge motor driver IC. H-bridge is the simplest circuit for controlling a low current-rated motor. One H-bridge is capable to drive a DC motor bidirectional. L293D is a current enhancing IC. It can also act as a switching device.

v. LCD 16X2

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and the seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

v. 12V DC Battery

Batteries come in various shapes, measures and contrast in their purposes. The 12V battery is one of such normal batteries. In any case, what do you are familiar the 12-volt battery and what is its utilization? A 12-volt battery is a sort of battery that is frequently utilized for different electrical contraptions and machines. The 12-volt battery is unmistakable and different in its utilization, as it comes in various shapes and sizes.

vi. DC Motor

A DC engine or direct flow engine is an electrical machine that changes electrical energy into mechanical energy by making an attractive field that is controlled by direct flow. At the point when a DC engine is fuelled, an attractive field is made in its stator.

IV. WORKING PRINCIPLE

GPS module gets the location information from satellites in the form of latitude and longitude. The microcontroller processes this information and sends it to the GSM modem. The GSM modem then sends the information to the owner's mobile phone and print the user location in LCD 16X2 (Latitude, Longitude). The user can access vehicle location using GSM and GPS can able to start the vehicle and check the location status.
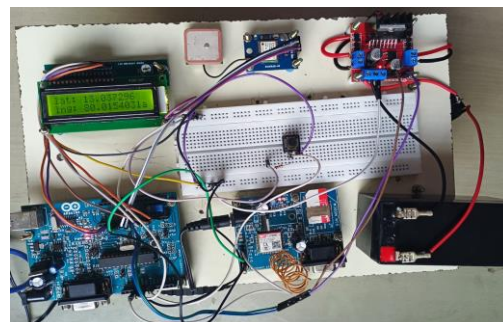
V. BLOCK DIAGRAM
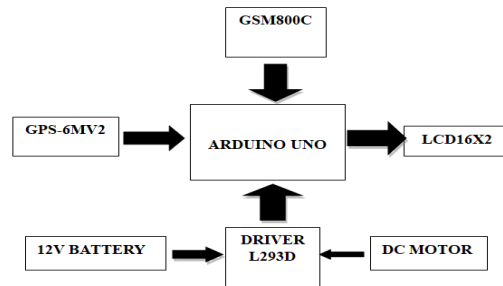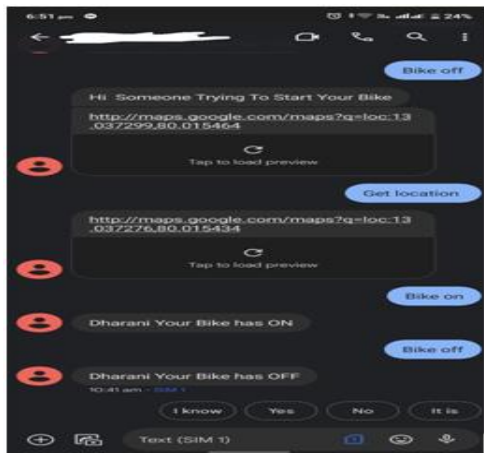

Fig 5.1 Block diagram

VI. FLOW CHART
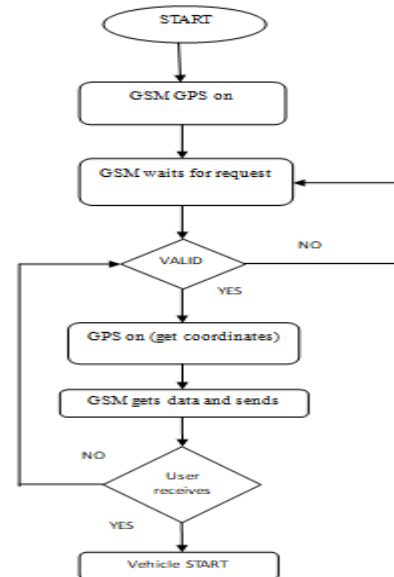
Fig 6.1 Flowchart

VII. OUTPUT

Fig 7.1 Hardware Result

These are the output which is observed while working. Fig 7.1 shows the hardware setup of the system and shows the tracking location when the user pressed the key that shows the final result

Fig 7.2 Alert message using GSM in Mobile

The Security system for E-vehicle which allows the immediate response to the user. The user press the button the GSM module send the SMS to the user. Fig 7.2 Shows the Send the Alert message to the user.

VIII. CONCLUSION

GPS and GSM installed in the vehicle shares the vehicle information to our server and create smart tracking. There are many reasons why car owners and public drivers love to have GPS. Fleet operators often use vehicle tracking systems such as navigation, planning, on board telematics and security for fleet management. Other applications include monitoring the driving behaviour of, for example, workforce workers or parents of underage drivers.

IX. FUTURE SCOPE

In future, we will integrate other devices such as sensors into the vehicle. We may create servers to determine traffic and other information for users

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